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Dynamic Posturography

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Related Policies (if applicable)
None

Disclaimer

Carefully check state regulations and/or the member contract.
Each benefit plan, summary plan description or contract defines which services are covered, which services are excluded, and which services are subject to dollar caps or other limitations, conditions or exclusions. Members and their providers have the responsibility for consulting the member's benefit plan, summary plan description or contract to determine if there are any exclusions or other benefit limitations applicable to this service or supply. **If there is a discrepancy between a Medical Policy and a member's benefit plan, summary plan description or contract, the benefit plan, summary plan description or contract will govern.**

Coverage

Dynamic posturography **is considered experimental, investigational, and/or unproven**.

Policy Guidelines

None.

Description

Dynamic posturography tests a patient's balance control in situations intended to isolate factors that affect balance in everyday experiences. Posturography provides quantitative information on the degree of imbalance present but is not intended to diagnose specific types of balance disorders.

Background
Balance Disorders

Complaints of imbalance are common in older adults and contribute to the risk of falling in this population. Falls are an important cause of death and disability in this population in the United States (U.S.). Maintenance of balance is a complex physiologic process, requiring the interaction of the vestibular, visual, and proprioceptive/somatosensory system, and central reflex mechanisms. Balance is also influenced by the general health of the patient (i.e., muscle tone, strength, range of motion). Therefore, identifying and treating the underlying balance disorder can be difficult. Commonly used balance function tests (e.g., electronystagmography, rotational chair tests) attempt to measure the extent and site of a vestibular lesion but do not assess the functional ability to maintain balance.

Role in Diagnosis

Dynamic posturography aims to provide quantitative information regarding a patient's functional ability to maintain balance. The patient, wearing a harness to prevent falls, stands on an enclosed platform surrounded by a visual field. By altering the angle of the platform or shifting the visual field, the test assesses movement coordination and the sensory organization of visual, somatosensory, and vestibular information relevant to postural control. The patient undergoes 6 different testing situations designed to evaluate the vestibular, visual, and proprioceptive/somatosensory components of balance. In general terms, the test measures an individual's balance (as measured by a force platform to calculate the movement of the patient's center of mass) while visual and somatosensory cues are altered. These tests vary by whether the eyes are open or closed, the platform is fixed or sway-referenced, and whether the visual surround is fixed or sway-referenced. Sway-referencing involves making instantaneous computer-aided alterations in the platform or visual surround to coincide with changes in body position produced by sway. The purpose of sway-referencing is to cancel out accurate feedback from somatosensory or visual systems that are normally involved in maintaining balance. In the first 3 components of the test, the support surface is stable, and visual cues are either present, absent, or sway-referenced. In tests 4 to 6, the support surface is sway-referenced to the individual, and visual cues are either present, absent, or sway-referenced. In tests 5 and 6, the only accurate sensory cues available for balance are vestibular cues. Results of computerized dynamic posturography have been used to determine what type of information (i.e., visual, vestibular, proprioceptive) can and cannot be used to maintain balance. Dynamic posturography cannot be used to localize the site of a lesion.

Posturography tests a patient's balance control in situations intended to isolate factors that affect balance in everyday experiences. Balance can be rapidly assessed qualitatively by asking the patient to maintain a steady stance on a flat or compressible surface (i.e., foam pads) with the eyes open or closed. By closing the eyes, the visual input into balance is eliminated. Use of foam pads eliminates the sensory and proprioceptive cues. Therefore, only vestibular input is available when standing on a foam pad with eyes closed.

Regulatory Status

In 1985, the NeuroCom EquiTest® (NeuroCom International, Portland, OR; now Clackamas, OR), a dynamic posturography device, was cleared for marketing by the U.S. Food and Drug Administration (FDA) through the 510(k) process. Other dynamic posturography device makers

include Vestibular Technologies (Cheyenne, WY) and Medicapteurs (Balma, France). Companies that previously manufactured dynamic posturography devices include Metitur (Jyvaskyla, Finland) and Micromedical Technology (Chatham, IL). FDA product code: LXV.

Rationale

Medical policies assess whether a medical test is clinically useful. A useful test provides information to make a clinical management decision that improves the net health outcome. That is, the balance of benefits and harms is better when the test is used to manage the condition than when another test or no test is used to manage the condition.

The first step in assessing a medical test is to formulate the clinical context and purpose of the test. The test must be technically reliable, clinically valid, and clinically useful for that purpose. Medical policies assess the evidence on whether a test is clinically valid and clinically useful. Technical reliability is outside the scope of this policy and credible information on technical reliability is available from other sources.

Dynamic Posturography

Clinical Context and Test Purpose

The purpose of dynamic posturography in individuals who have balance dysfunction is to inform a decision whether to pursue additional diagnostic workup (e.g., imaging studies that would not have been indicated based on clinical presentation alone) or immediate treatment.

Population

The relevant population of interest is individuals presenting with balance dysfunction or dizziness. It would be expected that these individuals will have had an initial basic evaluation directed by symptoms that will have included a clinical examination and history, with appropriate vital signs and orthostatic blood pressure measurements, and may have had basic evaluations as directed by their symptoms (e.g., electrocardiogram).

Interventions

The intervention includes a class of dynamic posturography tests. A number of tests have clearance from the U.S. Food and Drug Administration. The specific maneuvers may be operator dependent.

Comparators

Depending on the clinical presentation, individuals with balance dysfunction may be managed with clinical evaluation alone or with more intensive evaluations including vestibular function testing, which can be used to localize the cause of the dysfunction.

Outcomes

The outcomes of interest are to diagnose and treat the underlying condition correctly. The time frame of interest is months to approximately a year.

Study Selection Criteria

For the evaluation of clinical validity of dynamic posturography, studies that meet the following eligibility criteria were considered:

- Reported on the accuracy of the marketed version of the technology (including any algorithms used to calculate scores);
- Included a suitable reference standard;
- Patient/sample clinical characteristics were described;
- Patient/sample selection criteria were described.

Clinically Valid

A test must detect the presence or absence of a condition, the risk of developing a condition in the future, or treatment response (beneficial or adverse).

Review of Evidence

No studies were identified that evaluated the sensitivity and specificity of dynamic posturography for diagnosing any specific balance disorder compared with commonly accepted balance tests. There is no criterion standard test for measuring balance, which is a physiologic parameter. Absent a criterion standard comparison, the literature search sought to identify studies that systematically compared results of dynamic posturography and other balance tests in an appropriate patient population (i.e., individuals at increased risk of falling due to balance issues).

Several studies have used both dynamic posturography and another test for assess balance. For example, Fritz et al. (2015) assessed the correlation between dynamic and static posturography and other measures of gait and balance dysfunction in 57 ambulatory patients with multiple sclerosis (MS). (1) Two dynamic posturography parameters and 4 static posturography parameters were measured. Walking velocity (the alternative test) was measured in 2 ways: 1) in a laboratory using the Optotrak Motion Capture System and 2) using the timed 25-foot walk test. In regression analysis, demographics, one of the dynamic posturography parameters (anteroposterior sway) and one of the static posturography parameters (eyes open, feet apart) explained 95.3% of the variance in walking velocity. A higher degree of anteroposterior sway, assessed using dynamic posturography, was significantly associated with higher walking velocity. Although the study found that dynamic posturography was associated with measures of walking velocity, the utility of this information regarding impact on patient management is uncertain.

A study by Ferrazzoli et al. (2015) compared dynamic posturography with the Berg Balance Scale (BBS) score. (2) The BBS is a 14-item tool that assesses performance on a variety of functional tasks, each rated on a 0-to-4 scale (maximal score, 56 points). Lower scores indicate higher fall risk. The study included 29 patients with Parkinson disease (PD) not complaining of balance problems and 12 healthy controls matched for age and sex. Scores on the BBS were significantly lower in PD patients than in controls (p=0.002). Similarly, results of body sway analysis assessed by posturography differed significantly between PD patients and controls.

Specifically, compared with controls, PD patients had higher standard deviation of body sway measurements in the eyes open (p=0.005) and in the eyes open counting (p=0.020) conditions. The standard deviation of PD patients was also higher than controls in posturography along the mediolateral axis in the eyes open condition (p=0.019), but results were similar in the eyes open counting condition. The authors suggested that posturography could be used to identify early balance disorders in PD patients before they develop clinical symptoms, and that rehabilitation programs could be developed to address specific balance issues. As discussed in the next section, there is a lack of prospective studies comparing health outcomes in patients managed with and without dynamic posturography.

Other published literature on dynamic posturography has assessed fall risk in older individuals and other populations. (3-6) For example, Whitney et al. (2006) retrospectively reviewed 100 charts of individuals referred to a balance and falls clinic with a vestibular diagnosis using dynamic posturography. (6) Patients who reported multiple falls over 6 months had lower initial scores on the Sensory Organization Test (SOT) than those who reported one or no falls.

Additional studies have used dynamic posturography as a research tool to study balance (e.g., in older individuals, PD patients, knee osteoarthritis patients); these studies were not designed to evaluate the clinical validity of dynamic posturography. (7-11) Dynamic posturography has also been considered a control technique in studies evaluating other novel methods of assessing balance. For example, Alahmari et al. (2014) assessed the reliability and validity of a balance rehabilitation device and compared findings with dynamic posturography using the EquiTest. (12)

Clinically Useful

A test is clinically useful if the use of the results informs management decisions that improve the net health outcome of care. The net health outcome can be improved if patients receive correct therapy, or more effective therapy, or avoid unnecessary therapy, or avoid unnecessary testing.

Direct Evidence

Direct evidence of clinical utility is provided by studies that have compared health outcomes for patients managed with and without the test. Because these are intervention studies, the preferred evidence would be from randomized controlled trials (RCTs).

No randomized or nonrandomized controlled studies were identified that compared health outcomes in patients when treatment decisions were made with and without the results of dynamic posturography. A 2009 RCT was identified, but it used dynamic posturography as an outcome measure, rather than as a tool for making treatment decisions; thus, conclusions cannot be drawn from it on the impact of posturography on patient management. (13)

Several retrospective studies have described a customized exercise program based on results of a complete medical and neuro-otologic history and physical examination that included platform posturography. (14, 15) However, the contribution of dynamic posturography to the overall

assessment and customization of the exercise program by the Badke group is unclear. In particular, the reports do not describe how (or whether) the exercise programs were modified based on specific deficits identified by platform posturography. Customized vestibular rehabilitation programs can be devised with a standard battery of tests. (16) These retrospective reports are also limited by selection bias and lack of follow-up. Moreover, while these studies show that individualized therapy could improve patient outcomes, no controlled trials have assessed whether individually customized therapy programs are more effective than generic vestibular exercises.

Also, other related studies have included the use of posturography in the assessment of patients after clinical intervention. Examples included studies conducted with PD patients (17, 18) and assessment of patients with idiopathic normal pressure hydrocephalus before and after shunt surgery. (19) For instance, Nocera et al. (2009) used posturography to evaluate the effectiveness of a home-based exercise program on postural control for 10 patients with PD. (18) The 10 patients and 10 healthy age-matched controls were assessed with dynamic posturography before and after the 10-week intervention. Dynamic posturography was not used to select patients for the intervention or to individualize the intervention.

Chain of Evidence
Indirect evidence on clinical utility rests on clinical validity. If the evidence is insufficient to demonstrate test performance, no inferences can be made about clinical utility.

Section Summary: Dynamic Posturography
Describing the diagnostic performance of dynamic posturography in terms of sensitivity and specificity is difficult given the lack of a true criterion standard for measuring balance. The available studies comparing dynamic posturography with other types of clinical measures of balance have suggested that posturography results correlate with those measures; however, whether dynamic posturography can be used as a diagnostic test is unknown. Direct evidence of how dynamic posturography can be used to improve outcomes is lacking. In the absence of direct evidence for a diagnostic test, a chain of evidence can sometimes be identified to demonstrate improvement in health outcomes. However, in the case of dynamic posturography, the chain of evidence about clinical validity and how the test would be used in practice is uncertain; therefore, no inferences can be made about clinical utility.

Summary of Evidence
For individuals with suspected balance disorders who receive dynamic posturography, the evidence includes cross-sectional comparisons of results in patients with balance disorders and healthy controls and retrospective case series reporting outcomes for patients assessed with dynamic posturography as part of clinical care. Relevant outcomes are test accuracy and validity, symptoms, and morbid events. There are no generally accepted reference standards for dynamic posturography, which makes it difficult to determine how testing results can be applied to clinical care. There are no studies demonstrating the clinical utility of the test that would lead to changes in management that improve outcomes (e.g., symptoms, function). The

evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

Practice Guidelines and Position Statements

American Academy of Otolaryngology-Head and Neck Surgery

In a position statement adopted in 2007 and revised in 2014, the American Academy of Otolaryngology-Head and Neck Surgery recognized computerized dynamic platform posturography and dynamic (or moving) platform posturography as medically indicated and appropriate tools in the evaluation or therapy of certain persons with suspected balance or dizziness disorders. (20)

In 2017, updated guidelines on the management of benign paroxysmal positional vertigo were published; posturography is not mentioned. (21)

Ongoing and Unpublished Clinical Trials

A search of ClinicalTrials.gov in December 2023 did not identify any ongoing or unpublished trials that would likely influence this policy.

Coding

Procedure codes on Medical Policy documents are included **only** as a general reference tool for each policy. **They may not be all-inclusive.**

The presence or absence of procedure, service, supply, or device codes in a Medical Policy document has no relevance for determination of benefit coverage for members or reimbursement for providers. **Only the written coverage position in a Medical Policy should be used for such determinations.**

Benefit coverage determinations based on written Medical Policy coverage positions must include review of the member's benefit contract or Summary Plan Description (SPD) for defined coverage vs. non-coverage, benefit exclusions, and benefit limitations such as dollar or duration caps.

CPT Codes	92548, 92549
HCPCS Codes	None

*Current Procedural Terminology (CPT®) ©2024 American Medical Association: Chicago, IL.

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Centers for Medicare and Medicaid Services (CMS)

The information contained in this section is for informational purposes only. HCSC makes no representation as to the accuracy of this information. It is not to be used for claims adjudication for HCSC Plans.

The Centers for Medicare and Medicaid Services (CMS) does not have a national Medicare coverage position. Coverage may be subject to local carrier discretion.

A national coverage position for Medicare may have been developed since this medical policy document was written. See Medicare's National Coverage at <https://www.cms.hhs.gov>.

Policy History/Revision

Date	Description of Change
06/15/2025	Reviewed. No changes.
08/15/2024	Document updated with literature review. Coverage unchanged. No new references added.
11/15/2023	Reviewed. No changes.
07/01/2022	Document updated with literature review. Coverage unchanged. No new references added; some removed.
09/01/2021	Reviewed. No changes.
08/15/2020	Document updated with literature review. Coverage unchanged. Reference 22 updated.
04/15/2019	Reviewed. No changes.
07/01/2018	Document updated with literature review. Coverage unchanged. Reference 4 added.
07/15/2017	Reviewed. No changes.
07/01/2016	Document updated with literature review. Coverage unchanged. Rationale and references significantly revised.
03/15/2015	Document updated with literature review. Coverage unchanged.
09/15/2014	Document updated with literature review. Coverage unchanged.
07/15/2012	Document updated with literature review. Coverage unchanged. “This document is no longer scheduled for routine literature review and update” was removed from the document.

07/01/2008	Revised/updated entire document
09/01/2006	Revised/updated entire document
12/01/2003	Revised/updated entire document
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01/01/1996	Revised/updated entire document
10/01/1994	Revised/updated entire document
04/01/1993	Revised/updated entire document
05/01/1990	New medical document